

REMARKS**A. Status of the Specification**

On page 11 of this paper, Applicant has made three amendments to the specification, in order to correct some minor typographical errors. No new matter has been added by these amendments.

B. Status of the Claims and Explanation of the Amendments

Prior to the submission of this paper, claims 1-7, 9-12, 14, 16, 18, and 24-26 were pending in this application. In this paper, Applicant has requested cancellation of claims 3, 4, and 9 without prejudice or disclaimer. After these claim cancellations have been entered, the claims under examination will be claims 1, 2, 5-7, 10-12, 14, 16, 18, and 24-26.

Claims 1, 3, 5, 6-7, 10-11, and 26 have been rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,682,402 to Nakayama ("Nakayama"). Claim 2 has been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Nakayama, in view of U.S. Patent No. 5,654,811 to Spitzer ("Spitzer"). Claims 4 and 9 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Nakayama, in view of U.S. Patent No. 6,831,409 to Yamada ("Yamada"). Claims 12, 14, 16, and 25 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Nakayama, in view of U.S. Publication No. 20010048496 to Baek ("Baek"). Claim 18 has been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Nakayama, in view of U.S. Patent No. 6,791,261 to Shimoda ("Shimoda"). Finally, claim 24 has been rejected under 35 U.S.C. §103 (a) as allegedly being unpatentable over Nakayama, in view of Baek, and further in view of Spitzer.

In this paper, independent claims 1, 12, 16, and 26 have been amended to clarify the invention. Support for these amendments is generally found throughout the specification. See e.g., Figures 1 and 2 and the corresponding text. No new matter has been added by these amendments.

C. Applicant's Claims Are Not Anticipated by Nakayama

Applicant respectfully traverses the rejection of claims 1, 3, 5, 6, 7, 10, 11, and 26 under 35 U.S.C. §102(b) as allegedly being anticipated by Nakayama. Briefly, Nakayama fails to teach, disclose, or suggest all of the claim elements of Applicant's claims. Accordingly, the rejection under 35 U.S.C. §102(b) should be withdrawn.

1. Nakayama Does Not Teach Applicant's "Resonant Layers"

Nakayama discloses a luminescent device in which a glass substrate (1) which acts as a reflector, a luminescent layer (2), a plurality of half mirrors (4a, 4b) and a buffer layer (5) overlap. In rejecting Applicant's claims, the Office Action asserts that the luminescent layer 2 and the buffer layer 5 as shown in FIG. 1a correspond to the buffer layers of the resonant layers of the present invention.

Applicant respectfully disagrees. According to Nakayama, the luminescent device shown in FIG. 1a includes two resonant layers, namely, a resonant layer including the glass substrate 1, the luminescent layer 2, and the half mirror 4b, and a resonant layer including the glass substrate 1, the luminescent layer 2, the half mirror 4b, the buffer layer 5 and the half mirror 4a. The latter resonant layer is different from the resonant layer of the present invention which includes "a first reflecting surface of a first reflector, a second reflecting surface of a

second reflector, and a buffer layer that is interposed between the first reflecting surface of the first reflector and the second reflecting surface of the second reflector.”

Also, Nakayama does not disclose that the half mirror 4b, the buffer layer 5 and the half mirror 4a constitute a resonant layer. Therefore, Nakayama does not disclose that "light resonated between one of the first reflector and the second reflector of one of the plurality of resonant layers and one of the first reflector and the second reflector of another of the plurality of resonant layers has a different predetermined wavelength from light resonated by one or more of the resonant layers”, as recited in Applicant’s claims.

Because not all claim elements are taught or suggested, the rejection of Applicant’s claims under 35 U.S.C. §102 should be withdrawn. MPEP §2131.

2. Nakayama Does Not Teach Applicant’s Device

As recited in the amended independent claim 1, Applicant’s light-emitting device has a plurality of resonant layers. Each of the plurality of resonant layers includes a first reflecting surface of a first reflector, a second reflecting surface of a second reflector, and a buffer layer that is interposed between the first reflecting surface of the first reflector and the second reflecting surface of the second reflector. Each of the plurality of resonant layers resonates light of a predetermined wavelength, which is emitted from the light-emitting device. The plurality of resonant layers overlap in the direction in which light is emitted from the light-emitting device, such that light having a different predetermined wavelength is resonated between the first reflecting surface of one of the plurality of resonant layers and the second reflecting surface of another of the plurality of resonant layers, which light is emitted from the light-emitting device. The first reflecting surface of the first reflector is arranged on a first side

through which the light is emitted from the light-emitting device, and the second reflecting surface of the second reflector is arranged on a second side opposite to the first side. The organic electroluminescent device forms one of the plurality of the resonant layers, the organic electroluminescent layer is the buffer layer thereof, and the first and second electrodes is the first reflector and the second reflectors thereof.

For example, as shown in FIG. 2, two resonant layers 31, 32 (each resonating light of a predetermined wavelength) overlap in the direction in which light is emitted from the light-emitting device. The resonant layer 31 is constituted of the organic electroluminescent device 23. The resonant layer 31 is constituted of the organic electroluminescent device (a first electrode, an organic electroluminescent layer and a second electrode). Each of the resonant layers 31, 32 resonates light of a predetermined wavelength (first resonated light, second resonated light), which is emitted from the device. In addition, a third resonant structure is formed between the reflecting surface 28a (first reflecting surface) of the resonant layer 32 and the reflecting surface 24a (second reflecting surface) of the resonant layer 31 to resonate light having a different predetermined wavelength (third resonated light), which is emitted from the light-emitting device. Basically, one useful feature of the present invention is that “n (n is a natural number that is 2 or more) resonant layers overlap in the direction in which the light is emitted from the light-emitting device, where each resonant layer resonates light with a predetermined wavelength and light is resonated between the first reflecting surface of one of the resonant layers and the second reflecting surface of another of the resonant layers, thus emitting from the light-emitting device, the resonated light with predetermined wavelengths whose number is more than n.”

For example, in the case where three resonated lights are emitted from the light-

emitting device, the light-emitting device has a five-layer structure that includes a reflector, a buffer layer, a second electrode as a reflector, an organic electroluminescent layer as a buffer layer and a first electrode as a reflector as shown in FIG. 2. Meanwhile, according to Nakayama, in the case where three resonated lights are emitted from the light-emitting device, the light-emitting device will need to have a seven-layer structure that includes a reflector, an organic electroluminescent layer, a transparent electrode, a first half mirror, a first buffer layer, a second half mirror and a second buffer layer. Accordingly, one advantage of the subject matter recited in claim 1, is that fewer resonant layers overlap in the light-emitting device, but that light with a broader distribution of wavelengths is resonated and emitted from the light-emitting device. This concept is not disclosed in Nakayama, and Nakayama's does not anticipate Applicant's claims.

In summary, Nakayama does not anticipate Applicant's claim 1. For at least similar reasons, amended independent claims 12, 16 and 26 are also allowable. Similarly, Applicant's corresponding dependent claims are allowable as well. In particular, Applicant emphasizes here that dependent claims 5 and 6 are not anticipated under 35 U.S.C. §102(b) by Nakayama. According to FIG. 5a of Nakayama, a resonant layer A is a part of another resonant layer B. Thus, the resonant layers A and B are not formed adjacent to each other and not formed at a distance from each other with a layer interposed therebetween, as recited in Applicant's claims.

D. Applicant's Claims Are Not Unpatentable Over the Cited References.

Applicant respectfully traverses the rejection of claims 2, 4, 9, 12, 14, 16, 18, 24 and 25 under 35 U.S.C. §103(a) as allegedly being unpatentable over the references cited in the

Office Action. The references, alone or in combination, fail to teach, disclose or suggest all of the claim elements of Applicant's claims. Additionally, in some cases the Office Action has also failed to provide a proper motivation to combine references or has relied on impermissible hindsight, as set forth below.

1. Claim 2 Is Not Unpatentable Over Nakayama and Spitzer

Applicant respectfully traverses the rejection of claim 2 under 35 U.S.C. §103(a) as allegedly being unpatentable over Nakayama, in view of Spitzer for at least the following two reasons (1) the Office Action has not provided any proper motivation to combine these references [MPEP §2143.01]; and (2) the references do not teach, disclose, or suggest all of the claim elements of claim 2 [MPEP §2143.03].

In rejecting claim 2, the Office Action merely states that

Nakayama discloses all of the limitations of claim 2 except the light source emitting white light. Spitzer discloses a light source emitting white light for emitting a wide or multiline spectrum of light. Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use a white light to emit a wide or multiline spectrum of light. [Office Action, page 5].

This circular reasoning falls far short of the standard for providing a proper motivation to combine references. According to the MPEP §2143.01, "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where the is some teaching, suggestion or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art" (emphasis added). No such teaching, suggestion, or motivation has been provided in the rejection of claim 2, only a reiteration of certain features of Spitzer's device. Moreover, the

mere fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness. MPEP § 2143.01. Accordingly, a *prima facie* case of obviousness has not been established.

Moreover, neither reference appears to teach, disclose, or suggest “a plurality of resonant layers, wherein each resonant layer comprises a first reflecting surface of a first reflector and a second reflecting surface of a second reflector, and a buffer layer that is interposed between the first reflecting surface of the first reflector and the second reflecting surface of the second reflector” as recited in Applicant’s claims. At best, Spitzer mentions an electroluminescent device which has one transparent electrode and one highly reflective electrode [Spitzer, col. 40, lines 30-55], but does not mention a “plurality of resonant layers” as recited in Applicant’s specification. Similarly, Nakayama does not teach Applicant’s “resonant layers”, as noted above in the discussion of the rejections of Applicant’s claims under 35 U.S.C. §102.

For at least these reasons, the rejection of claim 2 under 35 U.S.C. §103(a) should be withdrawn. Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 2 under 35 U.S.C. §103(a).

2. Claims 4 and 9 Are Not Unpatentable Over Nakayama and Yamada

Applicant respectfully traverses the rejection of claims 4 and 9 as allegedly being unpatentable over Nakayama in view of Yamada. These references, alone or in combination, fail to teach, disclose or suggest all of the claim elements in Applicant’s claims, such as, for example, “a plurality of resonant layers, wherein each resonant layer comprises a first reflecting surface of a first reflector and a second reflecting surface of a second reflector, and a buffer layer

that is interposed between the first reflecting surface of the first reflector and the second reflecting surface of the second reflector” as recited in Applicant’s claims. At best, it appears that Yamada discusses an electroluminescent device which has one resonant cavity, as shown, for example, in Figures 6 and 11 and the corresponding text. Furthermore, Nakayama does not teach Applicant’s “resonant layers”, as noted above in the discussion of the rejections of Applicant’s claims under 35 U.S.C. §102. For at least this reason, the rejection of claims 4 and 9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Nakayama, in view of Yamada, should be withdrawn.

3. Claims 12, 14, 16, and 25 Are Not Unpatentable
Over Nakayama In View of Baek

Applicants respectfully traverse the rejection of claims 12, 14, 16, and 25 under 35 U.S.C. §103(a) as allegedly being unpatentable over Nakayama, in view of Baek, for at least two reasons: (1) the combination of references relies on impermissible hindsight to provide the motivation for the combination, and (2) the combination of references fails to teach, disclose, or suggest all of the claim elements. For at least these reasons, the rejection of claims 12, 14, 16, and 25 under 35 U.S.C. §103(a) should be withdrawn.

With respect to Applicant’s first reason for traversal (impermissible hindsight), Applicants note that the Office Action asserts that Nakayama teaches all of the claim elements of claims 12 and 16, except for “a liquid crystal display and a light emitting device arranged at the back side of the liquid crystal display to serve as a backlight” [Office Action, page 6, lines 16-18]. For these elements, the Office Action relies on Baek, which is directed to a transreflective LCD that can utilize either ambient light or a backlight device to generate an image. The Office

Action further notes that even though Nakayama fails to teach an LCD and a backlight device, Nakayama does disclose that Nakayama's devices "can be applied to form an vivid image by means of a simple control function" [Nakayama, col. 7, lines 21-24]. On this basis, the Office Action concludes that "it would have been obvious to one of ordinary skill in the art to use Nakayama's light source to form a display that can be applied to form a vivid image by means of a simple control function" [Office Action, bridging paragraph of pages 6 and 7].

To the extent that Office Action's motivation for the combination of references can be understood, Applicant takes it to mean that the Office Action views the mere disclosure by Nakayama of forming "a vivid image by means of a simple control function" as providing adequate motivation to combine Nakayama's multiplex resonance devices with Baek's transreflective LCD. If this is indeed the Office Action's position, Applicant respectfully disagrees. As far as Applicant is aware, a "simple control function" is not a term in this art that is suggestive of a transreflective LCD system, much less the particular one taught by Baek. Thus, it appears that the Office Action, acting under the influence of impermissible hindsight reasoning, is reading far too much into this phrase. See MPEP §2145. In other words, this phrase from Nakayama does not provide motivation to combine Nakayama with Baek, because it is too generic. Moreover, the mere fact that the references could be combined is not enough to establish a *prima facie* case of obviousness. MPEP §2143.01.

For at least similar reasons, Applicant maintains that the rejection of claims 14 and 25 over the combination of Nakayama and Baek is motivated by impermissible hindsight. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 12, 14, 16, and 25. MPEP §2145.

With respect to Applicant's second reason for traversal (failure of the references

to teach all claim elements), Applicant again notes that Nakayama does not disclose, expressly or otherwise, “a plurality of resonant layers, wherein each resonant layer comprises a first reflecting surface of a first reflector and a second reflecting surface of a second reflector, and a buffer layer that is interposed between the first reflecting surface of the first reflector and the second reflecting surface of the second reflector” as recited in Applicant’s claims. Baek does not alleviate this deficiency of Nakayama, as Baek is primarily concerned with a transreflective LCD system. Applicant, upon review of Baek, respectfully assert that Baek does not teach a “plurality of resonant layers” as recited in Applicant’s claims.

Because not all claim elements are taught or suggested, the rejection of claims 12, 14, 16, and 25 under 35 U.S.C. §103(a) over Nakayama in view of Baek should be withdrawn. *See* MPEP §2143.03.

4. Claim 18 Is Not Unpatentable Over the Combination
of Nakayama and Shimoda

In rejecting claim 18 under §103, the Office Action relies on Nakayama for all claim elements, with the exception of resonated light comprising blue, red, and green light. For this element, the Office Action relies on Shimoda.

In response, Applicant again stresses that Nakayama fails to teach, disclose or suggest all of Applicant’s claim elements. For example, Nakayama fails to teach, disclose, or suggest an “organic electroluminescent device...and...a plurality of resonant layers...wherein the organic electroluminescent device forms one of the plurality of the resonant layers in which the organic electroluminescent layer is the buffer layer thereof and the first and second electrodes are the first reflector and the second reflector thereof”, as recited in Applicant’s claims.

This deficiency is not cured by Shimoda. For example, for Shimoda merely discloses that a light generating layer can have a transparent positive electrode and a reflective negative electrode [see *e.g.*, Shimoda, Figures 1 and 3-12, and the accompanying text, particularly col. 8, lines 44-54.]. Accordingly, Applicant respectfully asserts that Shimoda does not teach, disclose, or suggest an “organic electroluminescent layer...and the first and second electrodes are the first reflector and the second reflector thereof” as recited in Applicant’s claims.

Thus, the combination of Nakayama and Shimoda fails to teach, disclose, or suggest all of the claims elements of claim 18, as would be required for a proper rejection under 35 U.S.C. §103(a). Applicant respectfully requests reconsideration and withdrawal of the rejection of this claim.

5. Claim 24 Is Not Patentable Over Nakayama, In
view of Baek and Spitzer

In its rejection of claim 24, the Office Action alleges that “Nakayam[a] and Baek disclose all limitations of claim 24 except the color filter comprises a red filter, a green filter, and a blue filter” [Office Action, page 7, lines 21-22]. For these claim elements, the Office Action relies on Spitzer. However, Applicant has previously shown in the foregoing that all of these references fail to teach, disclose, or suggest a “light source body... wherein said light source body comprises a first and a second electrode that function as half mirrors that partially reflect light” as recited by Applicant’s claim 24. Thus, the combination of these references is similarly deficient. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 24 under 35 U.S.C. §103(a) as allegedly being unpatentable over Nakayama, in view of Baek, and in further view of Spitzer.

CONCLUSION

Based on the foregoing amendments and remarks, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims and allowance of this application.

AUTHORIZATION

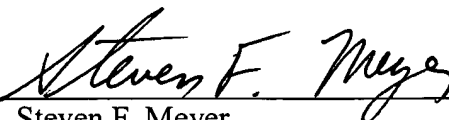
The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. 13-4500, Order No. 5095-4068. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 13-4500, Order No. 5095-4068. A DUPLICATE OF THIS DOCUMENT IS ATTACHED.

Respectfully submitted,
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